

Inhibition of MAPKs and IL-6 Mediated Cardiac Hypertrophy by *Escherichia coli* Nissle Treatment in Diabetic Rats

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Abstract:

Cardiac contractile dysfunction and cardiac pathologic hypertrophy are frequently observed in diabetic rat. The diabetic rat was induced by STZ (streptozotocin), cardiac function was examined using echocardiography, and the protein kinases were determined by Western blot. Cardiac hypertrophy-related mitogen-activated protein kinases (MAPK) pathways and the IL-6/MEK5/ERK5 signaling pathway were significantly activated in the hearts of diabetic rat. Hypertrophy-related mitogen-activated protein kinases (MAPK) pathways including p38, c-Jun N-terminal kinases (JNK) and extracellularly responsive kinase (ERK1/2), all activations contribute to the up-regulation of cardiac pathologic hypertrophy markers including atrial natriuretic peptide (ANP) and B-type natriuretic peptide (BNP), and leads to cardiac contractile dysfunction. *E. coli* Nissle treatment significantly inhibited the up-regulation in MAPK (e.g., p38, JNK and ERK1/2) and IL-6/MEK5/ERK5 signaling pathway. Thus, they reduce the levels of cardiac pathologic hypertrophy markers such as ANP and BNP, and resulting in the improvement of the cardiac contractile function. Results of this study show that *E. coli* Nissle had the potential cardio protective effects in reducing diabetic cardiomyopathy.

Keyword: *E. coli* Nissle, diabetes, Cardiac function, STZ-induced